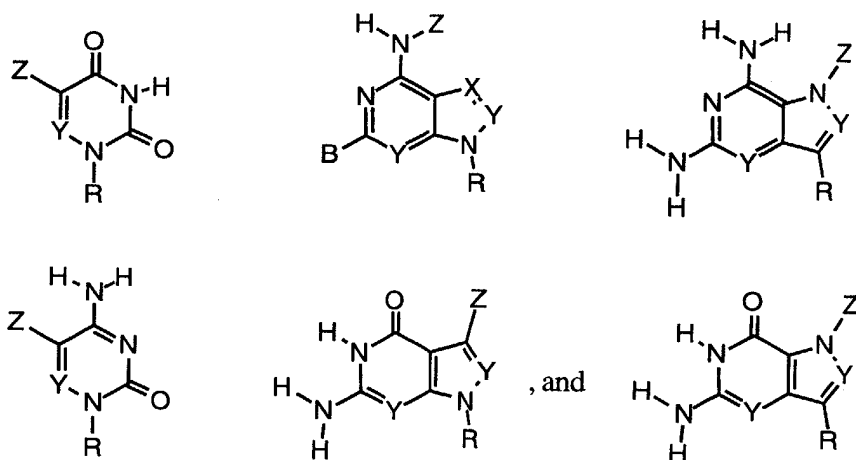


-CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-imidazole, -CH<sub>2</sub>CH<sub>2</sub>-imidazole, lower alkyl, -CH<sub>2</sub>-imidazole, and -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-NH<sub>2</sub>.

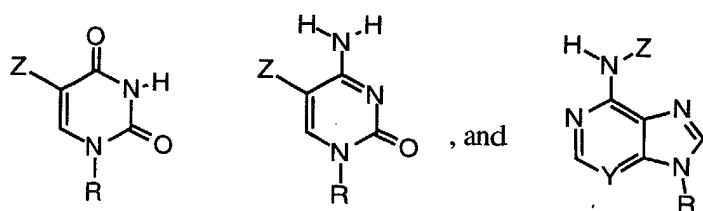
Claim 7 (amended). An [The] improvement [of claim 6 wherein said nucleobase is] in a method for creating a catalyst for a preselected reaction, said method comprising:

- a) synthesizing a mixture of oligonucleotides from nucleotide building blocks each having a region of randomized sequence
  - b) incubating said mixture under conditions where oligonucleotides that catalyze said reaction undergo as a result of their catalytic activity a chemical transformation that makes them preferentially [partitionable] separable from other oligonucleotides in the mixture having less catalytic activity [or amplifiable to oligonucleotides in the remainder of the mixture that have diminished or none of said catalytic activity].
  - c) [partitioning] separating the oligonucleotides with increased catalytic activity from the other oligonucleotides in the mixture
  - d) [amplifying] copying the oligonucleotides having increased [affinity] catalytic activity *in vitro* to yield a mixture of oligonucleotides enriched in those with increased [affinity] catalytic activity [for said target].
- wherein the improvement comprises including among said nucleotide building blocks those carrying nucleobases selected from the group consisting of



wherein -R designates the point of attachment to the ribose or 2'-deoxyribose ring, B is selected from the group consisting of -H or -NH<sub>2</sub>, X is either a nitrogen atom or a carbon atom bearing a substituent Z, Z is [either a hydrogen,] an unfunctionalized lower alkyl, alkynyl, or alkyl-alkynyl chain, or a lower alkyl, alkynyl, or alkyl-alkynyl chain bearing an amino, carboxyl, hydroxy, thiol, aryl, indole, or imidazolyl group, Y is either N or CH, and the ring contains no more than three nitrogens consecutively bonded.

Claim 8 (amended). The improvement of Claim [6] Z, wherein said nucleobase is selected from the group consisting of



wherein -R designates the point of attachment to the ribose or 2'-deoxyribose ring, and wherein Z is selected from the group consisting of -C≡C-CH<sub>2</sub>-NH<sub>2</sub>, -C≡C-CH<sub>2</sub>-SH, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-NH<sub>2</sub>, -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-SH, -CH<sub>2</sub>-NH<sub>2</sub>, -CH<sub>2</sub>-SH-, CH<sub>2</sub>CH<sub>2</sub>-NH<sub>2</sub>, -CH<sub>2</sub>CH<sub>2</sub>-SH,

-CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-imidazole, -CH<sub>2</sub>CH<sub>2</sub>-imidazole, lower alkyl, -CH<sub>2</sub>-imidazole, and -CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>-NH<sub>2</sub>.

Claim 9 (amended). An improvement in a method for creating a catalyst for a preselected reaction, said method comprising:

- a) synthesizing a mixture of oligonucleotides from nucleotide building blocks each having a region of randomized sequence
- b) incubating said mixture under conditions where oligonucleotides that catalyze said reaction undergo as a result of their catalytic activity a chemical transformation that makes them preferentially [partitionable] separable from other oligonucleotides in the mixture having less catalytic activity [or amplifiable to oligonucleotides in the remainder of the mixture that have diminished or none of said catalytic activity],
- c) [partitioning] separating the oligonucleotides with increased catalytic activity from the other oligonucleotides in the mixture
- d) [amplifying] copying the oligonucleotides having increased [affinity] catalytic activity in vitro to yield a mixture of oligonucleotides enriched in those with increased [affinity] catalytic activity [for said target],  
wherein said improvement comprises:
  - e) including an organic cofactor during step (b) [an organic cofactor], wherein said organic cofactor [carries an organic functional group that] binds noncovalently to the oligonucleotides [so enriched] and carries functionality not present on natural oligonucleotides.